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| AUTHOR | Doyle, Wayne J.; And Others |
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ABSTRACT

A study of teacher perceptions of student ability as related to first grade reading achievement examined the notions that teacher expectancy does affect the performance of pupils and that teacher expectations are influenced by the sex of the pupil. Female first grade teachers (N=11) in a suburban school provided estimates of the IQ (MIQ) of each pupil after two months of school just prior to administration of the Otis-Lennon Mental Ability Test (Form J) to measure IQ (MIQ). At the end of the academic year the Stanford Reading Achievement Test (Form W) was given, its paragraph meaning score serving as the criterion variable. Chi square, analysis of covariance, and regression analysis were used in testing three hypotheses: 1) Estimated cognitive abilities of first grade boys will be biased downward from the measured while that of girls will be biased upward. 2) When measured cognitive abilities are controlled, reading achievement scores of those pupils whose estimated cognitive abilities are biased upward from the measured cognitive abilities will be greater than the scores of those pupils whose abilities are biased downward. 3) When measured cognitive abilities are controlled, reading achievement scores for first grade girls will be greater than for boys. Data, in the direction hypothesized, offer strong evidence of the relationship between sex-linked teacher perceptions and reading achievement, indicating that teachers' estimates of pupil ability are associated with pupil achievement. (JS)

# TEACHERS' PERCEPTIONS: DO THEY MAKE A DIFFERENCE?*

Wayne J. Doyle
Greg Hancock
Edward Kifer
The University of Chicago



## Introduction

Numerous studies have been conducted and theoretical speculations abound concerning the determinants of children's academic achievements. Nevertheless, little is known about the relative contributions of various resources to pupil performance. There is even less evidence about the effects of teachers' perceptions of pupils on the production of schooling outcomes, or of the process involved.[1] In this study we are interested in the construct of teacher expectancy as it relates to first grade reading achievement when teacher perceptions of pupils have not been artificially induced. Basically, there are two reasons for doing research in this area. First, it is believed that success or failure in reading in the early years establishes the pattern for a youngster in his subsequent school experience. Second, the potential for control over teacher behavior (through selection and training) makes continued study of the expectancy phenomenon essential if we are serious about efficiency and productivity in education. Here, we examine two interrelated notions: that teacher expectancy does affect the performance of pupils; and that teacher expectations are influenced by the sex of the pupil. Three hypotheses are generated from these premises. The reasoning system used to arrive at these predictions follows.

## Rationale and Hypotheses

First grade teachers generally possess a preconceived notion of the attributes that a child should possess in order to succeed in school. Among these are good home background, positive

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attitude toward the school environment, social competence, verbal facility, and intelligence — all of which, of course, are measured by the yardstick of the existing social order. These "prerequisites for success" characteristics evolve from the belief that the function of the school is to teach and that pupils know what the classroom is all about since they are there to learn.

Teachers form perceptions, based upon the goodness of fit between the "real" and the "ideal," of pupils during the first few weeks of school. (Although we do not claim that the teacher behavior described in this rationale is a matter of intent: for the most part the acts are of a subconscious nature.) These perceptions influence expectations the teacher has for a given pupil. She looks for manifestations of these expectations. And lo! She sees evidence of expected pupil behavior because she is especially alert to particular stimuli. The discovery that expectations are being fulfilled influences the way the teacher treats pupils: (e.g., provision of "teaching" time; amount of positive reinforcement). The way the teacher reacts to "preferred" clients provides cues for pupils as to what kind of behavior is most acceptable. This further shapes teacher-pupil interaction[2] and promotes a specific pupil self-image. The amount of "teaching" time that the pupil receives and the enthusiasm with which he greets classroom experiences surely influence achievement. Goethe has told us "If you treat an individual as he is, he will stay as he is, but if you treat him as if he were what he ought to be and could be, he will become what he ought to be and could be."[3]

We submit that the determinants of teacher perceptions of pupils (e.g., teachers' view of pupils' attitudes, social competence, cognitive functioning) should be reflected in some proxy pupil variable which we call <u>teacher estimated cognitive ability.</u> Now, if teacher perceptions of pupils do influence the way in which they perform, then the achievement of those pupils whose estimated cognitive ability exceeds their measured cognitive ability should be greater than those pupils whose estimated ability is less than their measured ability. We would not

expect this effect to emerge, however, without controlling for measured ability because estimated and measured ability are correlated a priori.

Additionally, it is argued that girls will be favored over boys as estimates of cognitive ability are made by teachers, for they are influenced by the different classroom activity of the sexes. Girls seem to participate in school life more eagerly than do boys; they cooperate more fully with the teachers; and thus are more generally acceptable to (female) teachers.[4] The impressions created by these differing behaviors will cause teachers to discriminate between the sexes in making ability estimates.

The foregoing rationale leads to the following hypotheses:

Hypothesis 1: Estimated cognitive abilities of first grade boys will be biased downward from the measured while estimated cognitive abilities of girls will be biased upward.

Hypothesis 2: When measured cognitive abilities are controlled, reading achievement scores of those pupils whose estimated cognitive abilities are biased upward from the measured cognitive abilities will be greater than the scores of those pupils whose abilities are biased downward.

Hypothesis 3: When measured cognitive abilities are controlled, reading achievement scores for first grade girls will be greater than for boys.

While such operationalizations are necessary to guide our research, we emphasize the exploratory nature of this study.

## Methodology

This study was conducted in the first grade classrooms of a suburban school district. All participating classes had female teachers and the pupils were heterogeneously grouped. Teachers were asked to provide estimates of the IQ (EIQ) of each pupil after being involved with their classes for a period of two months but just prior to the administration of group ability tests. Teachers were familiar with the standardized test to be administered and were refreshed about the norming scale at the time they made their estimates. Within a period of two weeks after the teachers had estimated each pupil's IQ, the Otis-Lennon Mental Ability Test,

Form J, was given by guidance counselors. These scores are defined as the measured IQ (MIQ). At the end of the academic year the Stanford Reading Achievement Test (Form W) was administered and its paragraph meaning score serves as our criterion variable since by consensual validation it is considered to be the best single reflector of reading ability (MRE).

## Results

This study is by nature more exploratory than confirmatory. We present separately findings relevant to each hypothesis, thus attempting to investigate more thoroughly the notions that teachers' perceptions of first grade male cognitive abilities are systematically different from their perceptions of first grade female abilities; and that teachers' perceptions of pupil cognitive abilities influence the achievement of their pupils. We believe sufficient evidence is presented here to warrant further studies into these complex phenomena.

TABLE 1

Frequency Distribution of Discrepancies between MIQ and EIQ

| | MIQ Lower than EIQ | MIQ Higher than EIQ |
|---|---|---|
| Boys | 53 (41%) | 75 (59%) |
| Girls | 67 (57%) | 50 (43%) |

Table 1 reports the number of boys and girls whose MIQ was higher or lower than the teachers' perception of their IQ (EIQ). A chi-square test of goodness of fit yields a value of 6.2 ($p = .05$) indicating a significant difference between sexes.

TABLE 2

Mean IQ's by Sex

| | MIQ | EIQ |
|---|---|---|
| Boys | 103.0 | 99.9 |
| Girls | 102.8 | 104.5 |

Table 2, another way to look at the same hypothesis, indicates

mean scores of boys and girls on the two variables, MIQ and EIQ. A t-test for the hypothesis that the means for EIQ are equal yields a value of 2.42, significant at the .01 level.

These analyses support the well-documented idea that teachers discriminate systematically by sex in their perceptions of students. Some reasons for these prejudices' creeping into the domain of cognitive abilities will be discussed later.

Of equal interest to us, however, was whether these teacher impressions are related to pupil achievement. To test these hypotheses a 2 x 2 factorial design was employed, using factors labeled the sex effect and the discrepancy effect. The levels of the first factor are, of course, boys and girls; the levels of the second factor are comprised of those students whose EIQ exceeded their MIQ and those whose EIQ was less than their MIQ. We have called these two levels of the discrepancy effect 'biased up' (BU) and 'biased down' (BD), respectively. Since the cells of this design had unequal numbers (Boys-BD, N=75; Boys-BU, N=53; Girls-BD, N=50; Girls-BU, N=67), an analysis of variance for a non-orthogonal design was used. All computations for the design were performed on an IBM computer using MESA 98, a general statistical program for univariate and multivariate analysis of variance and covariance.

Table 3, a compilation of observed means across variables and levels of our design, offers a general view of the data:

TABLE 3

| | EIQ | MIQ | MRE |
|---|---|---|---|
| Boys N=128 | 99.9 | 103.0 | 2.09 |
| Girls N=117 | 104.5 | 102.8 | 2.20 |
| BU N=120 | 107.9 | 98.4 | 2.21 |
| BD N=125 | 96.5 | 107.2 | 2.08 |

Careful scrutiny of these means shows the data are in the direction hypothesized. In fact, a most striking difference emerges when a comparison is made between the MIQ and EIQ of the two discrepancy effect levels. On the reading achievement test, a group

of pupils with a mean MIQ of 98 is outperforming students whose average MIQ is 107. An analysis of variance using these means yielded no significant differences, a finding not completely unexpected since our hypotheses suggested that MIQ should be controlled before the effect of teachers' perceptions would emerge. Thus, a further analysis, this time using MIQ as a covariate (and so neutralizing its effects), was performed. Table 4 shows the results of that analysis:

TABLE 4

ACOV - MIQ as Covariate

| Source | df | ms | F | P |
|---|---|---|---|---|
| Sex effects | 1 | .842 | 3.20 | .07 |
| Disc effects | 1 | 6.428 | 24.44 | .0001 |
| Interaction | 1 | .359 | 1.36 | .24 |
| Error | 240 | .263 | | |

The limitations of the non-orthogonality of our design and the slightly high probability level keep us from pushing the significance of the sex effect too far. Nevertheless, the effect is in the direction we predicted, and when combined with our previous findings, offers additional evidence of a possible relationship between sex-linked teachers' perceptions and reading achievement. With a more rigorous design and larger groups, we believe a sex effect would emerge.

The significance of the discrepancy effect is evidence, we think, of some entity other than a student's measured cognitive ability operating in the development of reading skills. The basis upon which teachers make estimates of pupil ability is not clear, but those estimates may be related to student reading achievement. With MIQ partialed out, the discrepancy effect — a function of the difference between the child's measured cognitive ability (MIQ) and the teacher's perceptions of those abilities (EIQ) — is showing the rather large influence of EIQ when MRE is the criterion.

Further analyses using EIQ as a covariate and then both MIQ and

EIQ as covariates tended to support our initial insights. Of particular interest was the lack of a sex effect when EIQ was used as a covariate. We found that when EIQ is included in the analysis (and MIQ excluded), the girls tend to outperform the boys; however, when MIQ is included (and EIQ excluded), there is no apparent difference in performance. It appears that whatever is the basis for EIQ is more favorable to girls than to boys. Possible explanations of these data are put forward in the discussion section.

An implication of our results is that a teacher (or classroom) effect should emerge. That is, the mean reading achievement level of classes whose teachers have high aspirations should exceed that of classes whose teachers underestimate pupil potential. However, the dynamics of the phenomena are not so simple. Great expectations are not enough; they must be tempered by a teacher's discriminations among her pupils. The small number of teachers (N=11) in the study precludes a detailed statistical analysis of this suggestion. However, Table 5 shows the means of two groups of pupils, one whose teachers tend to overestimate ability and the other whose teachers tend to underestimate it. The results suggest the plausibility of a teacher effect.

TABLE 5

Mean Scores of Classes Taught By Overestimating and Underestimating Teachers

| | EIQ | MIQ | MRE |
|---|---|---|---|
| Overestimators (N=5) | 108.1 | 102.1 | 2.2 |
| Underestimators (N=5) | 98.4 | 105.8 | 2.07 |

In summary, our results suggest that both MIQ and EIQ are important variables in this reading achievement model. A regression analysis (Table 6 below) tends to support this notion but also point to the complexity of the interdependencies.

TABLE 6

Regression Analysis of MIQ and EIQ on MRE

| Dependent Variable | Independent Variables | |
|---|---|---|
| MRE | MIQ | EIQ |
| | r=.576 (p=.0001) | r=.589 (p=.0001) |
| | MIQ and EIQ | |
| | r=.616 (p=.0001) | |

Both MIQ and EIQ are highly related to MRE. (r's of .58 and .59 respectively.) Combined, however, they do not predict much better than either of them alone. While there may be some consensus about the MIQ construct, the conundrum is what EIQ represents. This is what we explore further.

## Discussion

Our data, then, offer strong evidence of the relationship between sex-linked teacher perceptions and reading achievement; and the emergence of the discrepancy effect indicates that teachers' estimates of pupil ability are associated with pupil achievement.

Given that our hypotheses are supported by the results, it remains to interpret them by exploring alternative feasible causations. The explanation proffered as a rationale for these hypotheses is that an expectancy effect is operative. For example: a teacher perceives a pupil to have positive/negative attributes; this arouses/diminishes the teacher's interest in, and consequently the amount of attention devoted to, her pupil who responds to this increase/decrease in the teacher's time and energy with more/less motivation to learn; hence, the pupil's performance improves/degenerates as a result of the "teaching" he gets and the motivation he generates.

There are at least two puzzling aspects of this conjectural process: Where do teacher's perception of pupils' attributes come from (i.e., upon what criteria do teachers formulate EIQ)? And why would the syndrome not work in reverse for some teachers (i.e., pupils perceived by a teacher to be "slow" or lacking in motivation would receive most of her attention)?

Undoubtedly, the teacher takes many cues from the general cognitive (e.g., aptitudes) and affective (e.g., degree of socialization) style of her pupils, some of which probably conflict: Johnny might be both a "good" pupil (he learns to recognize letter symbols quickly) and a "bad" boy ( he is bumptious in class). It may be that differing acculturation patterns for girls and boys in our society (interacting, perhaps, with some teacher characteristic say, sex) bias both prognosis for academic success and estimates of "brainpower" in favor of girls. We submit that this study has at least affirmed the probable operation of a ubiquitous expectancy phenomenon in the classroom. Just how much of this expectancy is due to idiosyncratic teacher attributes, independently of, say, generalized social norms, has obvious and powerful implications for the conduct of the educational enterprise.

The converse explanation is that <u>there is no expectancy effect</u>, that teachers are simply reporting as EIQ what they observe (some pupils perform better than others). A corollary is that this study merely shows that whatever IQ tests measure is not important (beyond a critical minimum, perhaps) for competence in first grade reading. Day-to-day observation by teachers and formative testing are saturated with pupils' reading activities. It is on these bases that teachers make their estimates. Consequently, the variables become confounded. However, this explanation in no way explains the differential performance of the "biased up" and the "biased down" groups on MRE or why the mean MIQ for these groups are not equal (although MIQ may well be the same for both groups in the population).

A series of studies is to be mounted in an effort to help clarify these issues. The design will be expanded to incorporate features such as pre and post-testing of pupil achivement; profiles of specified teacher and pupil characteristics; use of male and female teachers in urban and suburban schools; and classroom observations. The interdependency of some of these variables will necessitate a multivariate or simultaneous equations system analysis.

## FOOTNOTES

1. Work on the phenomenon has yielded problematic results:

   R. Rosenthal and L. Jacobson, Unfinished Pygmalion, New York, Holt, Rinehart and Winston, Inc., 1968.

   T. X. Barber, et al., "Five Attempts to Replicate the Experimenter Bias Effect," J. of Consulting and Clinical Psychology, Vol. 33, No. 1, 1969.

   R. E. Snow, Review of Unfinished Pygmalion in Contemporary Psychology, A Journal of Reviews, Vol. XIV. April, 1969.

2. T. L. Good and J. E. Brophy, "Teacher-Child Dyadic Interactions: A New Method of Classroom Observation," Journal of School Psychology, Vol. 8, No. 2, 1970.

   R. Rist, "Student Social Class and Teacher Expectations: The Self-Fulfilling Prophecy in Ghetto Education," The Harvard Educational Review, Vol. 40, August, 1970.

3. We are indebted to Peter and Carol Gumpert for recovering this axiom. See, "The Teacher as Pygmalion: Comments on the Psychology of Expectation," The Urban Review, September, 1968.

4. Patricia Sexton, Feminized Male, New York: Random House, 1969.